

17 August 1966

DEVELOPMENT OBJECTIVE

COLOR PRINT DRYER

1. INTRODUCTION.

1.1. Purpose. This document contains the requirements for a Government sponsored study and development project for the investigation of advanced methods of drying photographic color prints.

1.2. Background. Drying color prints matte and glossy involves different operations and distinct problems.

Many of the methods and techniques employed to dry black and white paper prints cannot be successfully applied to color prints due to the softness of the color emulsions and their tendency to become excessively "tacky" during the drying process.

1.2.1. Current Procedure.

1.2.1.1. Glossy Color Prints. Glossy color prints are dried in much the same way as glossy black and white prints. During the drying process, the emulsion is kept in contact with a highly polished chromed surface, usually a drum. The gelatin of the emulsion forms to the surface of the chromed plate or drum, leaving the print with a high gloss finish. Although many commercial dryers for black and white materials are used to dry glossy color prints (for example - Pako Drum Dryers), the drying process for glossing color prints is very critical. The drum has to be kept perfectly clean and polished, and sometimes it is necessary to condition the drum surface with glycerine and water to maintain a slick surface. Also, the temperature and speed of the dryer have to be kept within close tolerances. If these conditions are not closely adhered to, the prints will generally stick to the drum surface. Even when the operation is successful, the volume is limited because the dryers must use a slower speed for color print materials.

1.2.1.2. Matte Color Prints. There are no commercial print dryers that can rapidly dry color prints matte, in a quality manner; that is, dry them so there is no evidence of abrasions, scratches, emulsion frilling, curl, cracks, color shifts, etc. The most accepted method uses hot air drying racks. The prints are placed face up on a saran mesh shelf in the rack, where hot air is circulated around

them. This process takes at least 20 minutes and leaves curled and wavy prints, which then have to be flattened in a dry mounting press. During the flattening process there is danger of cracking the emulsion.

The other method of drying prints matte is to place them on a rack and allow them to air dry without applying heat. This method usually prevents severe curl in the prints, but it requires several hours of drying time.

In black and white photography, matte prints are usually dried around a drum with the print surface held against a canvas belt during the drying process. This method cannot be used for color prints because either the color emulsions adhere to the canvas belt or the belt marks the soft color print surface.

2. CONCEPT.

2.1. Purpose. The proposed program will encompass a thorough investigation and analysis of all advanced techniques in the area of color print drying. These techniques will be evaluated and the most feasible method for each of the two print (i.e. matte & glossy) drying requirements will be selected. Based on the selected techniques, one or two equipments for rapidly drying high-quality color paper prints shall be fabricated.

2.2. Scope. The total effort, as outlined above, will be divided into two separate but interrelated phases; continuance from the first phase to the second phase will be dependent on the successful accomplishment of Phase I. Proposals solicited at this time will be restricted to the tasks outlined in Phase I.

2.2.1. Phase I Investigation & Design Analysis. The contractor must extensively and exhaustively investigate all advanced drying techniques that may apply to the problem of drying color paper print materials matte and glossy. Emphasis must be placed on feasible solutions directed toward rapid, automated, high-quality drying systems. The techniques must be applicable to a system which will dry color prints in the best quality manner possible (Ref. Par 1.2.1.2.). At the conclusion of the investigation portion of Phase I, the contractor will present to the Government representative details of recommended techniques which can be applied to the development of a color print dryer or dryers. Advantages and disadvantages and ease of application of each alternate technique will be presented. Upon concurrence of the recommendations by the Government, the contractor will proceed to develop laboratory models or breadboard hardware which will successfully demonstrate the application of the most appropriate recommended techniques.

2.2.2. Phase II Equipment Prototype. Based on the successful demonstration of techniques in Phase I, it is presently planned to proceed to a hardware prototype stage. It would be desirable to combine both drying requirements into a single dryer. However, if separate components are proved necessary to solve the problems of drying color prints matte and glossy, this alternative will be considered. The prototype hardware will be suitable for installation and use in an operational area. More definitive specifications for prototype equipment will accompany the request for a proposal for performing this phase of the program.

3. GENERAL.

3.1. Proposals. Proposals submitted hereunder should be clear, concise, and limited in content to that information required to qualify the prospective bidder and demonstrate ability to perform satisfactorily within the scope of this document. Information on existing equipment which may be modified to meet the goals of this study may be included at the contractor's option.

3.1.1. Delivery. While it is the wish of the Government to accomplish the aims of this project as expeditiously as possible, sufficient time should be allotted for thorough and complete accomplishment of the aims set forth herein. It is envisioned that Phase I will take approximately eight months. The time span for Phase II will be discussed upon solicitation of a proposal for performing that portion of the work.

3.2. Administration. The Government will retain overall control of this project. Objectives, costs, priorities, subcontractors and consultants involved in this program fall within the jurisdiction of the Government and approval must be obtained before these factors are employed.

3.3. Contract Information. The contractor is expected to provide competent and cooperative administrative service. He will be vested with certain authority with the guidance of the technical monitor to control the direction and degree of technical effort within the bounds of the estimated costs.

3.3.1. Contractor Responsibility. As a part of the overall responsibility, the contractor will be responsible for the work performed by all of his subcontractors and consultants.

3.3.2. Technical Representative. The contracting officer will designate a Technical Representative to authorize specific development efforts of the contractor. Such authorization shall be given in writing in its original form or in confirmation of an oral authorization. The contractor will accept no other authorization except that of the Technical Officer or the contracting officer.

3.4. Documentation.

3.4.1. Regular monthly reports and a final report will be required from the contractor under this program.

3.4.2. All reports will meet the requirements of the applicable portions of Specification DB 1001 dated 31 August 1966, GENERAL REQUIREMENTS FOR CONTRACTUAL DOCUMENTATION.

DEVELOPMENT OBJECTIVE

COLOR SHEET FILM DRYER

1.0 INTRODUCTION:

1.1 PURPOSE: This document contains the requirements for a Government sponsored study and development project covering the investigation of advanced methods of drying photographic color sheet films.

1.2 BACKGROUND: Proper drying of color cut sheet film materials has always been a difficult problem. Many of the methods and techniques employed to dry black and white photographic materials cannot be successfully applied to color films due to the softness of the color emulsions and the tendency of these emulsions to become excessively "tacky" during the drying process.

1.2.1 CURRENT PROCEDURE: Cut sheet color films, both transparency and negative materials, are presently dried in a drying chamber or cabinet. The films are usually placed in film hangers in the drying cabinet and hot air is circulated around the film. This method is time consuming and does not dry the film in a quality fashion, that is, does not dry the film so that there is no evidence of water marks, abrasions, scratches, image distortion, peeling, curl, fading, color shifts, mottling, etc.

2.0 CONCEPT

2.1 PURPOSE: The proposed program will encompass a thorough investigation and analysis of all advanced techniques in the area of film drying. These techniques will be evaluated and the most practical and feasible method of color sheet film drying will be selected. Based on the selected technique a prototype color film dryer will then be developed which will not only dry color sheet film rapidly but which will also overcome the quality defects specified in Par 1.2.1.

2.2 SCOPE: The total effort, as outlined above, will be divided into two separate but interrelated phases; continuance from the first phase to the second phase will be dependent on the successful accomplishments of Phase I. Proposals solicited at this time are restricted to the tasks outlined in Phase I.

2.2.1 Phase I: INVESTIGATION AND DESIGN ANALYSIS

The contractor is expected to extensively and exhaustively investigate all advanced drying techniques (example: air bearing, ultrasonics) that may apply to the problem of drying both color negative and color positive types of sheet film. Emphasis should be placed on feasible and practical solutions directed toward a rapid, automated, high quality drying system. The techniques must be applicable to a system which will dry color film in the best quality manner possible; (Ref. Par. 1.2.1). At the conclusion of the investigation portion of Phase I, the contractor will present to the Government Representative a recommended technique or techniques which can be applied to the development of a color film dryer. Advantages and disadvantages and ease of application of each alternate technique will be presented. Upon concurrence of the recommendations by the Government, the contractor will proceed to develop laboratory models or breadboard hardware which will successfully demonstrate the application of the recommended technique.

2.2.2 Phase II: EQUIPMENT PROTOTYPE

Based upon the successful demonstration of techniques in Phase I, it is presently planned to proceed to a hardware prototype stage. The prototype hardware will be suitable for installation and use in an operational area. More definitive specifications for the prototype equipment will accompany the request for a proposal for performing this phase of the program.

3.0 GENERAL:

3.1. PROPOSALS: Proposals submitted here under should be clear concise, and limited in content to that information required to qualify the prospective bidder and demonstrate ability to perform satisfactorily within the scope of this document. Information on existing equipment which may be modified to meet the goals of this study may be included at the contractor's option.

3.1.1 DELIVERY: While it is the wish of the Government to accomplish the aims of this project as expeditiously as possible, sufficient time should be allotted for thorough and complete accomplishment of the aims set forth herein. It is envisioned that Phase I should take approximately eight months. The time span for Phase II will be discussed upon solicitation of a proposal for performing that portion of the work.

3.2. ADMINISTRATION: The Government will retain overall control of this project. Objectives, costs, priorities, subcontractors and consultants involved in this program fall within the jurisdiction of the Government and approval must be obtained before these factors are employed.

3.3 CONTRACT INFORMATION: The contractor is expected to provide competent and cooperative administrative service. He will be vested with certain authority, with the guidance of the technical monitor, to control the direction and degree of technical effort within the bounds of the estimated costs.

3.3.1 CONTRACTOR RESPONSIBILITY: As a part of the overall responsibility, the contractor will be responsible for the work performed by all of his subcontractors and consultants.

3.3.2 TECHNICAL REPRESENTATIVE: The contracting officer will designate a Technical Representative to authorize specific development efforts of the contractor. Such authorization shall be given in writing in its original form or in confirmation of an oral authorization. The contractor will accept no other authorization except that of the Technical Officer or the contracting officer.

3.4 DOCUMENTATION:

3.4.1 Regular monthly reports and a final report will be required from the contractor under this program.

3.4.2 All reports will meet the requirements of the applicable portions of Specification DB 1001 dated 31 August 1966, GENERAL REQUIREMENTS FOR CONTRACTUAL DOCUMENTATION.